FIFE Workshop 2014 What's new with CVMFS

TOPIC FOR WHAT'S NEW IN FIFE

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Major upgrades

- Since last year's workshop, cvmfs 2.1 clients have been installed at a large number of OSG sites
- About a dozen VOs are active in the OSG OASIS CVMFS distribution
- As the number of files grew, the CVMFS catalog became enormous and unwieldy
  - There are now separate catalogs for each VO in the oasis repository, and subcatalogs within each VO, generally one for each package release
  - Performance is greatly improved

Major upgrades

- The CERN/OSG Stratum 1s were all upgraded to CVMFS 2.1
  - Much easier to manage
  - Able to support 2.1 repositories which include many important features
    - Multiple repositories on the same repository server
    - Chunking of large files into smaller pieces
    - Transaction-based updates
    - Avoids needing an entire unpacked copy of the source files; uses a cvmfs client to view all the existing files in the compressed repo
- Multiple new client versions have come out over the last year with new features and bug fixes

Problem with slow updates understood

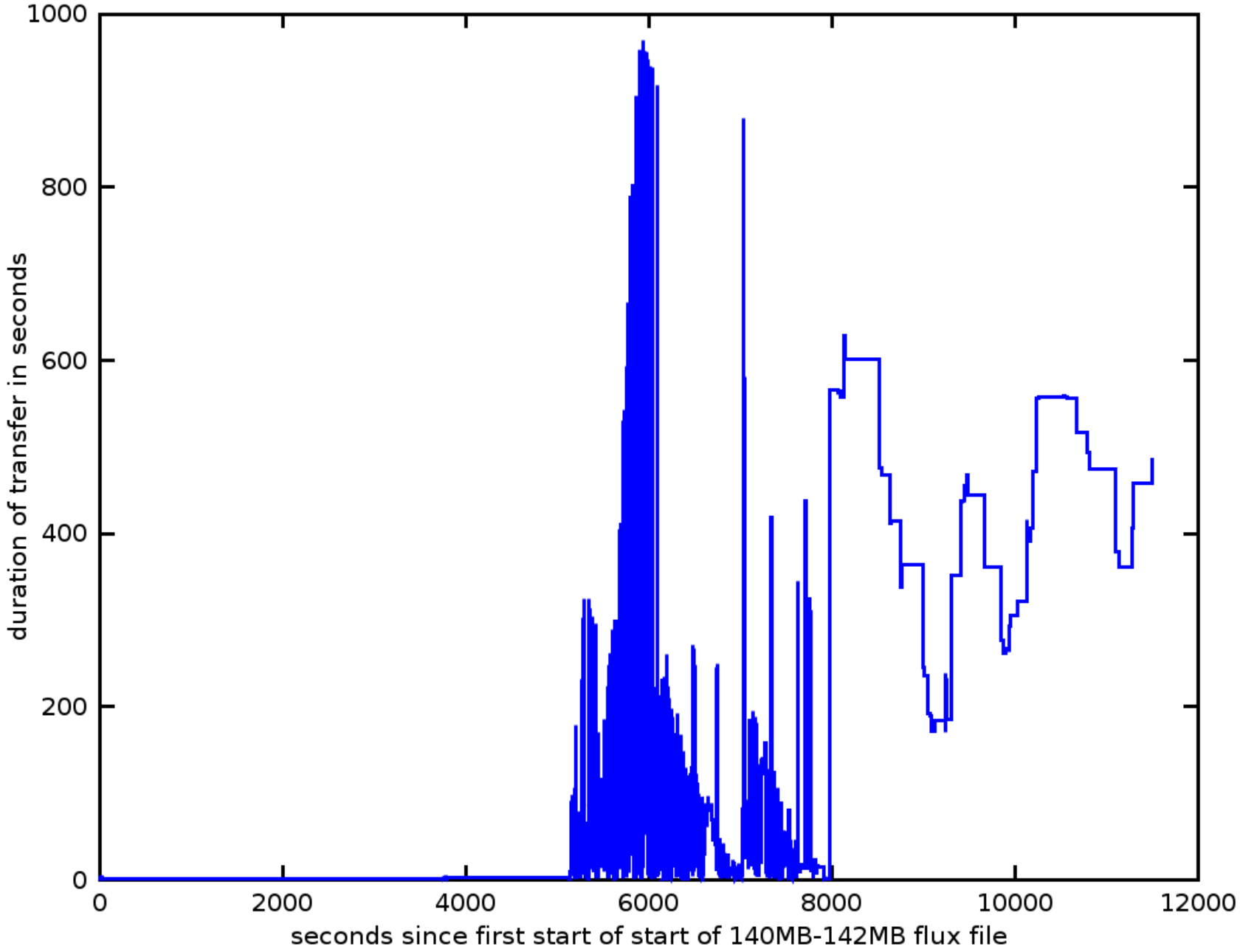
- CVMFS updates should be available within a couple of hours
  - Rarely it can be a little longer because stratum 1 busy updating other repositories
- There are however occasions where updates appear to be many hours behind
  - In those cases the cvmfs client is taking one minute to flush buffers and let's the application continue
  - Workaround: run /cvmfs/grid.cern.ch/util/cvmfs-uptodate in pilot or beginning of job
  - Permanent fixes being considered for future client release

OSG repositories hosted at Fermilab

- OSG now has the ability to distribute to the grid CVMFS repositories that are hosted at sites
  - Can mount on worker nodes with no change to them if they were set up as instructed
  - /cvmfs/fermilab.opensciencegrid.org is being set up as the first one, hosted here, a 2.1 repository
    - Evolution of /cvmfs/oasis.opensciencegrid.org/fermilab
    - Contains common UPS/UPD products and larsoft
  - Expect /cvmfs/nova.opensciencegrid.org to be next
  - Should become almost as easy to set up as fnal.gov repository
  - Access will be through ssh & Kerberos, not gsissh

Using CVMFS for auxiliary data files

- CVMFS is designed for distributing code, but many experiments have a need to distribute some data to a lot of nodes as well
- Prime example: neutrino “flux” files for the GENIE application
  - Measured a case of 128 jobs each reading 1.8GB of 140MB flux files, out of a 15GB dataset
  - Jobs ran on 87 different nodes
  - 4 2Gbit/s squids were used, but average transfer rate mostly limited to disk speeds (~4*30MB/s, ~1.2Gbit/s)


1000
800
600
400
200
0
duration of transfer in seconds
0
2000
4000
6000
8000
10000
12000
seconds since first start of start of 140MB-142MB flux file

Using CVMFS for auxiliary data files

- Several different possible solutions have been proposed
- One we're testing is using the CVMFS 2.1.17 client "Alien Cache" feature
  - Separate repositories for this type of data would be created, and configured in clients to store on local Storage Element (e.g. dCache, Lustre, HDFS, EOS)
  - Cache would be shared between the worker nodes
  - Files would get automatically transferred from central repo on demand
  - Not a solution for all types of data files

Coming up

- Sharing of repositories between OSG & EGI coming soon
  - Will require a config rpm upgrade on worker nodes
- Next cvmfs release will support distributing CVMFS configs in a CVMFS repository, so additional trusted distributions can be added centrally
  - Includes new method to support automated ordering of stratum 1 servers by distance

FIFE CVMFS Documentation

- https://cdcvs.fnal.gov/redmine/projects/fife/wiki/Introduction_to_FIFE_and_Component_Services#OASISCVMFS